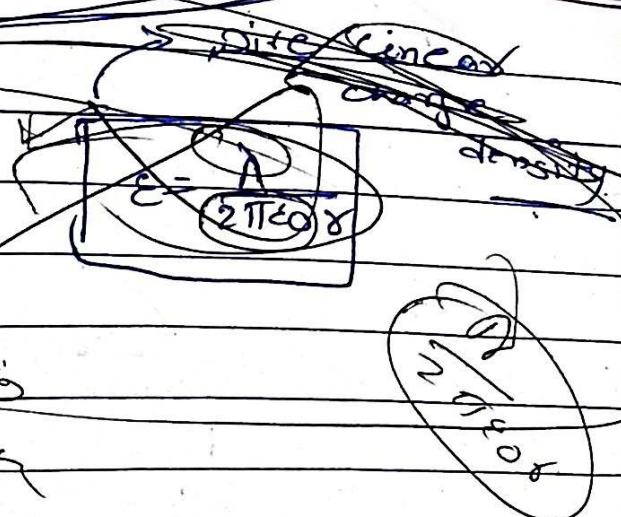
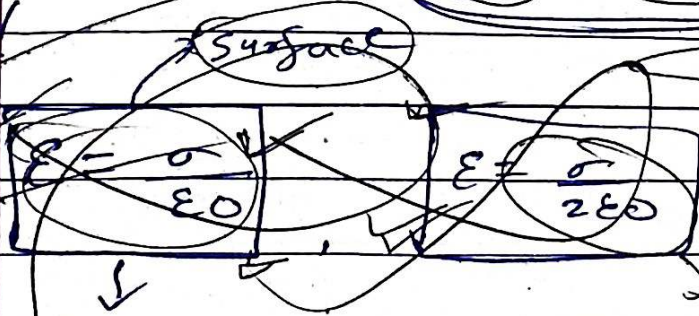


Chapter



~~conductors~~

high
common

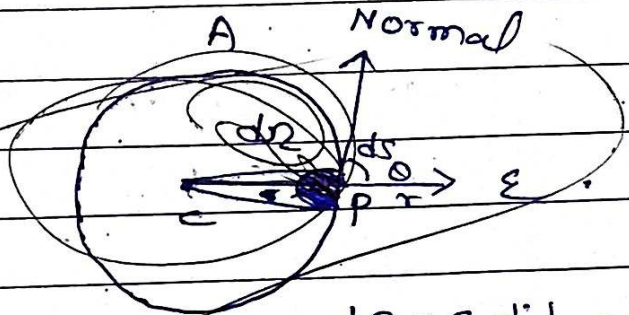
$\frac{1}{2\pi\epsilon_0\sigma}$

Gauss Law

→ If q charge present in a closed surface then the total flux coming from surface is equal to $\frac{q}{\epsilon_0}$

$$d\phi = \vec{E} \cdot d\vec{s}$$

$$= E ds \cos\theta$$



$d\Omega = \text{solid angle}$

$$\therefore E = K \frac{q}{r^2}$$

$$d\phi = \frac{Kq}{r^2} ds \cos\theta$$

$$d\phi = Kq \left(\frac{ds \cos\theta}{r^2} \right)$$

$$\therefore d\Omega = \frac{ds \cos\theta}{r^2}$$

$$d\phi = Kq d\Omega$$

$\frac{1}{2}$

$\frac{1}{4}$

$\frac{1}{2}$

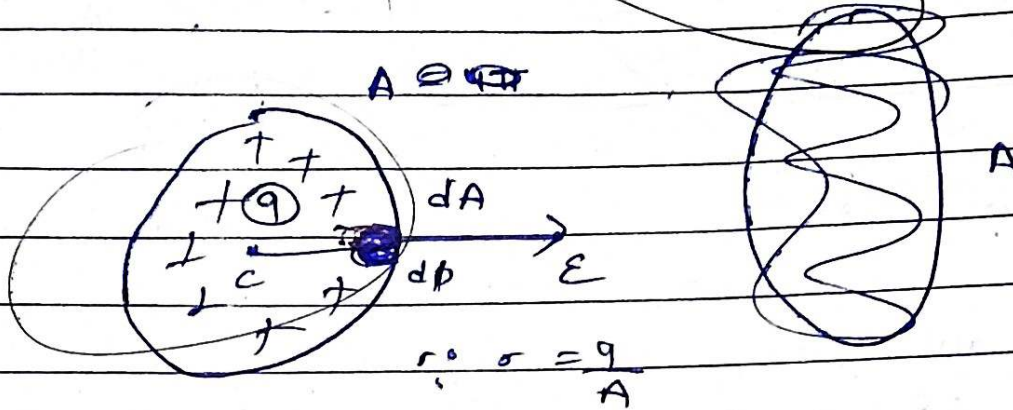
$$\int d\phi = \int Kq d\Omega$$

$$\phi = Kq \int d\Omega$$

$$\phi = Kq \Omega \quad (\text{Total solid angle } \Omega = 4\pi)$$

$$\phi = \frac{q}{\epsilon_0} \quad \text{proved.}$$

$E = \frac{\sigma}{\epsilon_0}$ conductor surface



$q = \sigma A$

$\oint \vec{E} \cdot d\vec{A} = \frac{q}{\epsilon_0}$

$\Phi = E \cdot \int dA$

$\Phi = E \cdot A$

A/c to Gauss theorem

$\Phi = \frac{q}{\epsilon_0}$

$\frac{q}{\epsilon_0} = E \cdot A$

$\therefore q = \sigma A$

$\frac{\sigma A}{\epsilon_0} = E \cdot A$

$E = \frac{\sigma}{\epsilon_0}$

$$E = \frac{\lambda}{2\pi\epsilon_0 r}$$

$$\phi = \vec{E} \cdot d\vec{A}$$

$$\phi = E \cdot A(2\pi r l)$$

$$\phi = E \cdot (2\pi r l)$$

Gauss's theorem

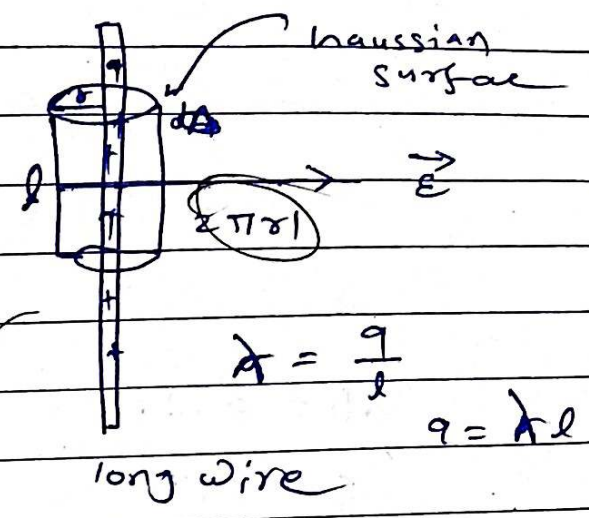
$$\frac{q}{\epsilon_0} = \phi$$

$$\phi = \frac{q}{\epsilon_0} = E \cdot (2\pi r l)$$

$$E = \frac{\lambda l}{\epsilon_0 (2\pi r l)} = \frac{\lambda}{\epsilon_0 2\pi r}$$

$$E = \frac{\lambda}{2\pi\epsilon_0 r}$$

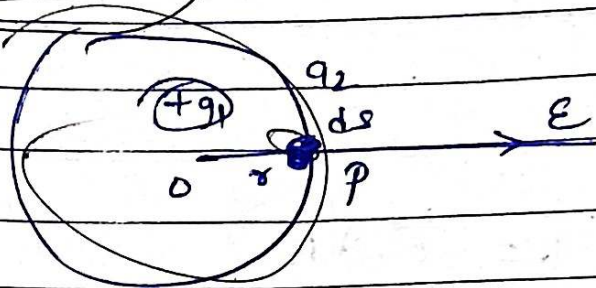
proved.



$$\lambda = \frac{q}{l} \quad q = \lambda l$$

$$2\pi r l \phi$$

• Coulombs Law from Gauss theorem



$$d\phi =$$

$$A = 4\pi r^2$$

$$d\phi = E \cdot dS$$

$$\phi = E \cdot A$$

$$\phi = E \cdot 4\pi r^2$$

$$\phi = \frac{q_1}{\epsilon_0}$$

$$\phi = \frac{q_2}{\epsilon}$$

$$\therefore E = \frac{q_1}{\epsilon_0 4\pi r^2}$$

Suppose a charge q_2 is at point P

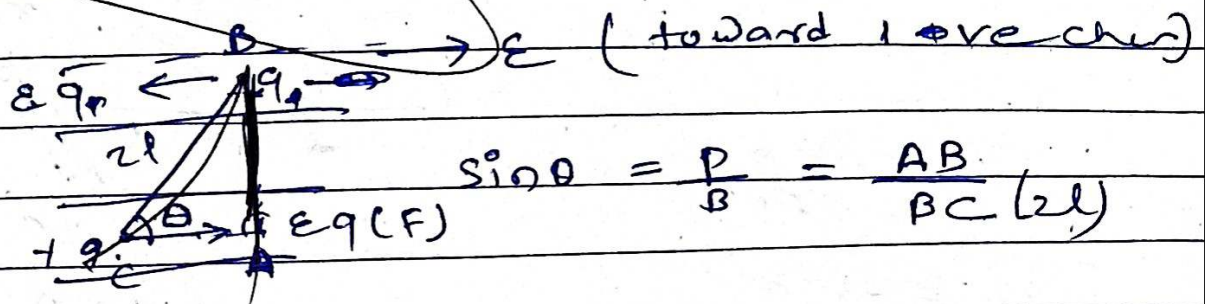
Force experienced by q_2 charge due to q_1 & E

$$F = q_2 E$$

$$F = \frac{q_1 q_2}{\epsilon_0 4\pi r^2} = \frac{1}{4\pi \epsilon_0} \frac{q_1 q_2}{r^2} = \frac{K q_1 q_2}{r^2}$$

Coulomb Law

$$\vec{\tau} = \vec{r} \times \vec{F}$$



$$\tau = F \times \perp \text{ distance b/w charge}$$

$$\tau = F \times AB$$

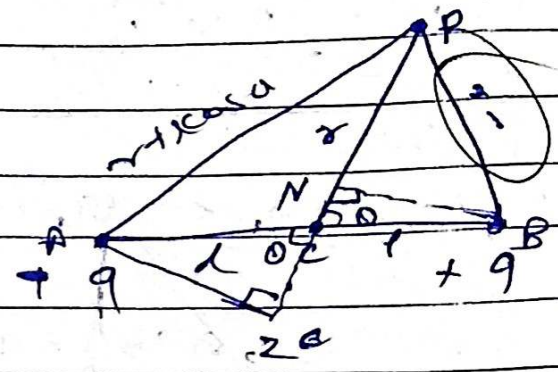
$$\tau = F \times 2l \sin \theta$$

$$\tau = eq \times 2l \sin \theta$$

$$\tau = E \times p \sin \theta$$

$$\therefore \boxed{\vec{\tau} = \vec{E} \cdot \vec{p}}$$

$$V = \frac{kqP \cos \theta}{r^2}$$



$$V_A = -\frac{kq}{(AP)}$$

$$V_A = -\frac{kq}{(r + l \cos \theta)}$$

$$V_B = +\frac{kq}{(r - l \cos \theta)}$$

ΔNCB

$$\cos \theta = \frac{NC}{CB(l)}$$

$$l \cos \theta = NC$$

$$PB = r - l \cos \theta$$

$$V_C = V_A + V_B$$

$$= \frac{kq}{(r + l \cos \theta)} + \frac{kq}{(r - l \cos \theta)}$$

ΔAZC

$$\cos \theta = \frac{ZC}{AC(l)}$$

$$ZC = l \cos \theta$$

$$AP = r + l \cos \theta$$

$$kq \frac{(r - l \cos \theta) + (r + l \cos \theta)}{(r + l \cos \theta)(r - l \cos \theta)}$$

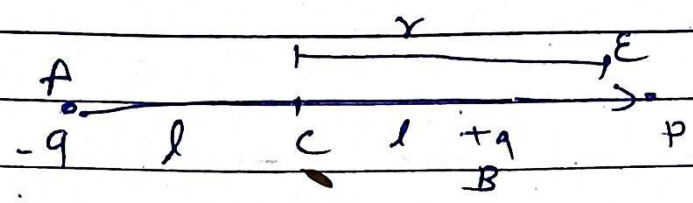
$$\frac{kq \cdot 2l \cos \theta}{(r + l \cos \theta)(r - l \cos \theta)}$$

$$\therefore l \ll r$$

$$\therefore V = \frac{kqP \cos \theta}{(r + 0)(r + 0)} = \frac{kqP \cos \theta}{r^2}$$

$$\boxed{\frac{kqP \cos \theta}{r^2}}$$

$$E = \frac{K \cdot 2q}{r^3}$$



$$E_A = \frac{-Kq}{(l+r)^2}$$

$$E_B = \frac{Kq}{(r-l)^2}$$

$$E = E_A + E_B = \frac{-Kq}{(r+l)^2} + \frac{Kq}{(r-l)^2} = Kq \left(\frac{1}{(r-l)^2} - \frac{1}{(r+l)^2} \right)$$

$$= Kq \left(\frac{1}{(r-l)^2} - \frac{1}{(r+l)^2} \right)$$

$$= \frac{Kq \left((r+l)^2 - (r-l)^2 \right)}{(r-l)^2 (r+l)^2} = Kq$$

$$= \frac{Kq \left(r^2 + 2rl + l^2 - r^2 + 2rl - l^2 \right)}{(r-l)^2 (r+l)^2} = \frac{Kq \cdot 4rl}{(r^2 - l^2)^2}$$

$$\frac{Kq \cdot 4rl}{(r^2 - l^2)^2}$$

$r \gg l$

$$\therefore \frac{2Kq \cdot l}{r^3} \quad \boxed{\frac{2Kq \cdot l}{r^3}}$$

Atoms

✓ Bohr's frequency condition

$$E_1 - E_2 = h\nu$$

$$E = h\nu$$

$$E = h\nu = \frac{hc}{\lambda}$$

Wavelength

Frequency

$$h = 6.62 \times 10^{-34} \text{ J s}$$

Region

Angular momentum of an electron in a hydrogen atom

$$\text{Minimum} = \frac{h}{2\pi}$$

$$mvr = n \frac{h}{2\pi}$$

Series

Region

Lyman

Ultraviolet

Balmer

Visible light

Paschen

Infrared (IR)

Brackett

11

Pfund

10

Humphreys

11

UV, IR, V

$$13.6 \text{ eV}$$

$$E_n = \frac{13.6}{n^2} \text{ eV}$$

orbital no.

$$E_n = \frac{13.6}{n^2} \text{ eV}$$

* Rydberg constant *

Wavelength per unit is called Rydberg const

$$\text{unit} = \frac{1}{\text{meter}}$$

$$R = 1.097 \times 10^7 \text{ m}^{-1}$$

W
A

Communication System

Page No.
 Date / /

• ~~Attenuation~~ is ~~Energy losses~~ during ~~propagation~~ ^{of time} ~~through channel~~ ^{of signal}

→ ~~transmit~~ ~~information~~

→ ~~medium~~ ~~in~~ ~~which~~ ~~signal~~ ~~propagates~~

• ~~Amplifier~~ is ~~a device~~ ~~which~~ ~~increase~~ ~~the~~ ~~strength~~ ~~of~~ ~~signal~~

• ~~Broad casting~~ ~~communication~~ ~~is~~ ~~point~~ ~~to~~ ~~point~~ ~~communication~~

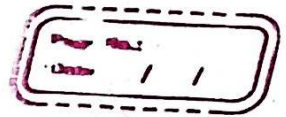
• ~~signal~~ ~~information~~ ~~converted~~ ~~into~~ ~~analog~~ ~~form~~ ~~of~~ ~~information~~ ~~in~~ ~~analog~~ ~~form~~

• ~~Modulation~~
↳ ~~mixing~~ ~~of~~ ~~signal~~ ~~with~~ ~~carrier~~ ~~frequency~~ ~~known~~ ~~as~~ ~~modulation~~

• FAX

↳ ~~facsimile~~ ~~telegraphy~~

↳ ~~Electronic~~ ~~reproduction~~ ~~of~~ ~~document~~ ~~or~~ ~~picture~~ ~~is~~ ~~called~~ ~~FAX~~



$$1 \text{ km} = 1000 \text{ m}$$

(meter) height of transmitter

max
transmission
area distance

Electromagnetic Waves

Optical fibre medium communication is based on Total internal reflection

frequency range of T.V. transmission
 $\rightarrow 30 \text{ MHz} - 300 \text{ MHz}$

Distance of communication satellite
 $\approx 36000 \text{ km}$

Base band change form of frequency of transmission signal

Band width + frequency of a signal is called Band Width.

fluctuation in signal strength at receiver

• Three mode of communication sys

- ① Space communication
- ② Satellite communication
- ③ Line communication

• Analogy signal / message

physical quantity that varies with time usually in a smooth and continuous function.

• Digital signal (message)

→ It is an ordered sequence of symbols selected from a finite set of discrete elements.

• Ground wave



→ wave which travel through atmosphere following the surface of earth

• Sky waves

ionosphere

transmitter

receiving antenna

• Space wave

transmitter
antenna

receiver

www

→ The world wide web is an information system that enables content sharing over the internet.

• Modulation

→ process of changing some characteristics of a carrier wave in accordance with the intensity of signal is known as modulation.

Types of Modulation

① ~~phase~~ phase of carrier wave varies
a/c to instantaneous amplit
of message

② frequency modulation

→ phase angle = const

→ frequency changes with carrier wave
a/c to modulating wave

③ Amplitude modulation

→ phase angle & angular frequency
const

→ carrier wave varies in acc
with modulating wave.

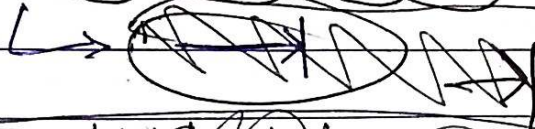
semiconductor

objective

~~Donor impurity atoms have 5 valency~~

• ~~If the current gain of a transistor is α and β then $\beta > 1$~~

• ~~Diode is used as a rectifier~~



• ~~PN junction transistor~~

→ R/W emitter current (i_E) base current (i_B) and collector current (i_C)

$$i_E = i_C + i_B$$

$$i_E = i_C + i_B$$

• ~~Germanium used as an impurity element in P-type semiconductor.~~

• ~~There is not much of amplification~~

→ in volt/cm by amplifier

Energy gap in semiconductor
2.1 eV

Reverse biased diode is Zener diode and photodiode.

Chap-2

Objective

potential gradient

$$\frac{dV}{dx}$$

$$E = -\frac{dV}{dr}$$

$$v = \frac{w}{q}$$

Electrostatic energy of the system made by two electric dipole kept at distance r .

$$\frac{1}{r^3}$$

- potential energy of two point charges of opposite sign is always negative

$$E = \frac{q_1 q_2}{4\pi\epsilon_0 r}$$

$$E = \frac{q^2}{2\epsilon_0 A}$$

$$C = \frac{\epsilon_0 A}{d}$$

capacitance of parallel plate capacitor:

- Dielectric strength for air

$$3 \times 10^6 \text{ Vm}^{-1}$$

- Capacity of spherical condenser

$$C = \frac{Q}{V} = \frac{4\pi\epsilon_0 R^2}{1/R} = 4\pi\epsilon_0 R$$

$$C = \frac{Q}{V} = \frac{4\pi\epsilon_0 R^2}{1/R} = 4\pi\epsilon_0 R$$

- Dielectric const of metal

$$\epsilon_r = \infty$$

Chap-2 (Subjective)

R/w b/w V & E

$$dW = -f dr \quad (1)$$

$$W = \frac{qV}{g}$$

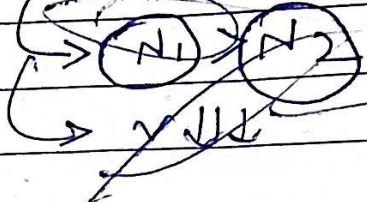
$$dW = q dr \quad (2)$$

$$q dr = -f dr$$

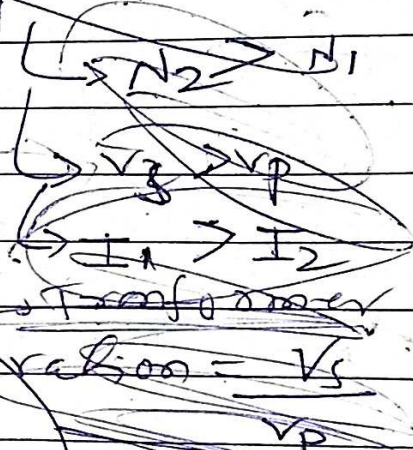
$$\frac{f}{q} = - \frac{dr}{dr}$$

$$E = - \frac{dr}{dr}$$

Step-down transformer



Step-up



Electromagnetic Induction

Electrical generator

frequency of L-C circuit

resonance

Page No.
 Date:

Chap - 1

objective



Capacitive reactance



$$X_C = \frac{1}{\omega C} = \frac{1}{2\pi f C}$$

$I_{r.m.s}$ and I_0 (peak value)

$$I_{r.m.s} = 0.707 I_0 \quad \text{for } DC = 0$$

Inductive reactance (X_L)

$$\omega \cdot L \quad \text{or} \quad X_L = 2\pi f L$$

(pure inductive; power factor = 0)

Powerless component of circuit

$$I \sin \phi \quad \text{phase difference b/w } I \text{ and } V$$

circuit

$$\text{Root mean square (r.m.s)} = \frac{1}{\sqrt{2}} I_0 \quad (\text{peak value})$$

unit of reactance = ohm (Ω)

- AC power loss only by resistor
- ~~DC is block by capacitor~~

~~Hot wire ammeter measure~~

~~r.m.s value of A.C~~

~~Virtual voltage (r.m.s) $\frac{V_{peak}}{\sqrt{2}}$~~

~~IRMS = 3.5 x 100~~

~~frequency of D.C. = 0~~

~~$I_{r.m.s} = \frac{peak}{\sqrt{2}}$~~

~~mean value of A.C current in full cycle $\rightarrow 0$~~

~~DC current is used in electroplating~~

~~$I_{r.m.s} \cos \phi$~~

~~power factor = $\frac{\text{True avg. power}}{\text{Apparent avg. power}}$~~

• power of L-R

$$Z = \sqrt{R^2 + \omega^2 L^2}$$

Impedance of L-R circuit

• power factor

$$\cos \phi$$

phase difference b/w

A.C current and e.m.f

• R.C

Dimension

• phase difference in L-R circuit

$$Z = \sqrt{R^2 + \omega^2 L^2}$$

• L-C-R

for resonance condition phase diffen

h/w voltage & current

zero

wa r l

~~Dispersi~~
Objectives

RAY OPTICS



~~Refractive index of mean color (yellow)~~

$$n = \frac{n_v + n_r}{2}$$

• Angular dispersion

$$(n_v - n_r)A$$

• Dispersive power

$$\omega = \frac{n_v - n_r}{n_r - 1}$$

• Optical path

refractive index $\times$ path length

$$\text{since } \frac{1}{\mu}$$

$$n = \frac{c}{v}$$

~~sin 90~~

• Angle of prism

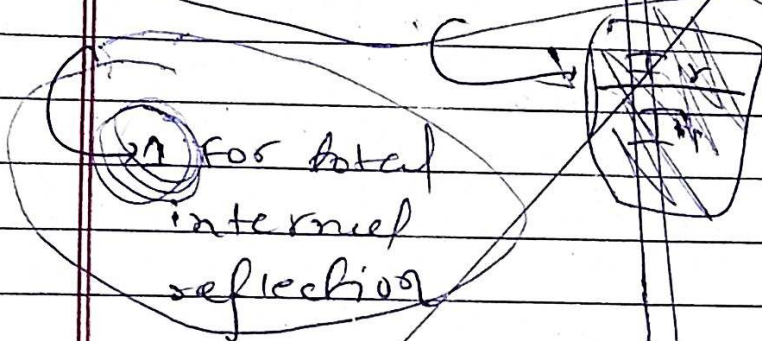
$$(n - 1)A$$

• Optical fibre works on the principle of total internal reflection.

• Transverse nature of light shown by polarization.

$$I_m = I_0 \cos^2 \theta$$

• Reflection coefficient



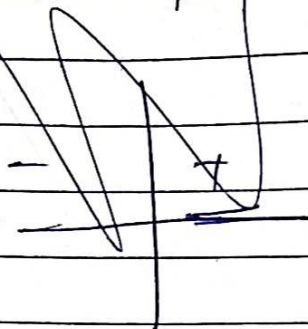
• Refractive index of material of prism

$$\mu = \frac{\sin\left(\frac{A + \delta}{2}\right)}{\sin \frac{A}{2}}$$

• One light year

$$9.46 \times 10^{15} \text{ m}$$

- Image formed by convex mirror is always b/w pole and focus.



- Concave lens

↳ - focal length, - power

- Convex lens

↳ + focal length, + power

- u is always -ve

- Retina form real & inverted image

~~Defect~~

Defects

- ① Short - sighted (myopia)

↳ Concave lens

- ② Long - sighted (hypermetropia)

↳ Convex

- ③ Presbyopia

↳ Bifocal lens.

- ④ Astigmatism

↳ Cylindrical lens

$V = \text{const}$ → Parallel → $\propto R$ Page No.:
Date: / / (const.)

Heat production $\propto \frac{1}{R}$ → series

$v_d \propto E$ → $\mu = \frac{v_d}{E}$ → mobility

EMF

parallel : $\frac{\epsilon_1 \gamma_2 + \epsilon_2 \gamma_1}{\gamma_1 + \gamma_2}$

$\epsilon_{eq} = \epsilon_1 + \epsilon_2$

The motion of e^- in conductor is drifting.

Conductance (σ)

$\sigma = \frac{1}{R}$ → ohm⁻¹

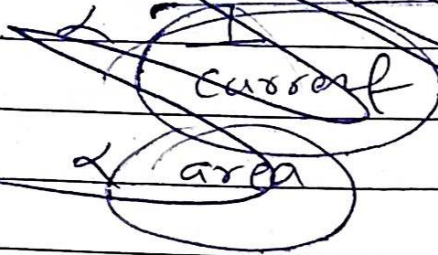
Speed of $e^- \propto \sqrt{V}$

$V_d \propto V$ $V_d = \frac{1}{L}$

~~$V_d \propto \sqrt{V}$~~ ~~$V_d \propto V$~~

Sensitivity of potentiometer

→ $\propto$ length of wire.



Chapter 9 Objective

→ $f_m = q(\vec{v} \times \vec{B})$

• magnetic field ($\vec{B}$) = $\frac{\text{weber}}{(\text{metre})^2}$

→ Lorentz force

$\vec{F} = q(\vec{E} + \vec{v} \times \vec{B})$

$B = \frac{\mu_0 I R^2}{2(R^2 + x^2)^{3/2}}$

$d\vec{B} = \frac{\mu_0}{4\pi} I (d\vec{r} \times \hat{r})$

Electromagnetic induction (M)



$\vec{B}$ at centre of current carrying circular coil is perpendicular to the plane of coil.

Magnetic field

Unit = Tesla or $\frac{\text{Weber}}{\text{m}^2}$, $\frac{\text{newton}}{\text{ampere-m}}$

Galvanometer

high resistance

Volt meter

Current obtain is galvanometer

$\rightarrow I \neq 0$

$I \neq 0$

galvanometer const

exp
NAB

$\rightarrow I \neq 0$

- Direction $\vec{B}$ inside current carry solenoid

parallel to axis.

No. of turn $\times$ Sensitivity of galvanometer

chap - 8

- Electromagnetic wave

nature = transverse

e.g. light wave, X-rays, infrared rays

direction = parallel to $\vec{B}$

- X-ray & γ -rays are not deflected by $\vec{E}$ & $\vec{B}$

$$\frac{1}{2} \epsilon_0 E^2$$

$$\frac{B^2}{2\mu_0}$$

pressure

have same dimen

magnetic

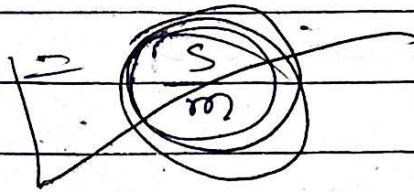
Energy $\left[M L^2 T^{-2} \right]$ energy density

$$E = cB$$

$$\frac{E}{B} = c$$

Tesla

volt/meter



$$\frac{\text{Weber}}{\text{m}^2} \times \text{Volt} = \frac{\text{V}}{\text{m}}$$

$$\text{Weber} = \text{Volt} \times \text{S} = \text{VS}$$

$$\frac{\text{VS}}{\text{m}} \times \frac{1}{\sqrt{\epsilon_0 \mu_0}} = \frac{\text{S}}{\text{m}}$$

Electromagnetic wave are transverse in nature because they can be polarised.

speed of EM wave

• wavelength.

(max) Radio $\rightarrow$ microwave $\rightarrow$ Infrared $\rightarrow$ Visible $\rightarrow$ Ultraviolet $\rightarrow$ X-rays $\rightarrow$ gamma rays
 $\rightarrow$ max frequency
 $\rightarrow$ max energy

• The phase difference b/w electric wave and magnetic wave

• (max) $\frac{1}{2}$

$\rightarrow$ 3×10^{10} cm/s

• The speed of electromagnetic wave depends on its wavelength, its intensity.

$\frac{c}{\lambda}$

Chap - 3

Subject

Page No.:
Date: / /

Drift velocity & ohm's Law

$$V_d = \frac{I}{neA}$$

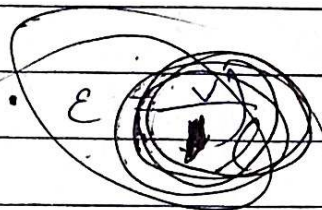
~~excess~~ charge on electr

n = no. of e per unit vol.

A = area of cross-section

$$V_d = \frac{eEt}{m}$$

$$V_d = \frac{eVT}{m}$$



$$I = \frac{eVT}{m}$$

$$I = n e A \left(\frac{eVT}{m} \right) = \frac{n e^2 A T}{m}$$

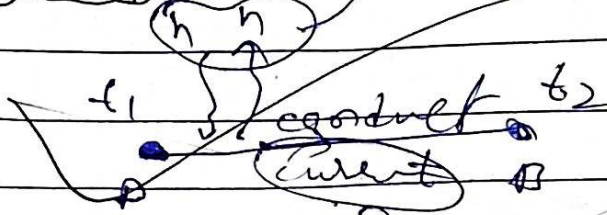
$$\frac{V}{I} = \frac{m}{n e^2 A} \rightarrow \text{const} = R$$

$$V = RI$$

$V \propto I$ Ohm's law

$$\rho = \frac{RA}{l} = \frac{m}{ne^2}$$

Thomson effect



Peltier effect

Seebeck effect

Copper - ohmic resistance

Diode - non-ohmic resistance

Electric power loss

$\frac{W}{t}$

conductor

Energy amount of heat
consumed by a

rate of energy is called
power

Electron EM wave

Waves in which E & B vibrate $\perp$ to each other and propagating along the direction to the E & B .

Defn: Transverse

speed equal to speed of light

$$c = \frac{1}{\mu_0 \epsilon_0}$$

Or

~~ex: ray, x-ray~~

E is more effective than B

Laser

high brightness

Highly directional with parallel beam

monochromatic ray

can be sharply focused

~~Electrical energy density~~

$$\frac{1}{2} \epsilon_0 E^2$$

magnetic energy density

$$\frac{1}{2\mu_0} B^2$$

$$\frac{1}{2} \mu_0 B^2$$

$$\text{ratio} = \frac{1}{2} \epsilon_0 E^2 \times \frac{\mu_0}{B^2}$$

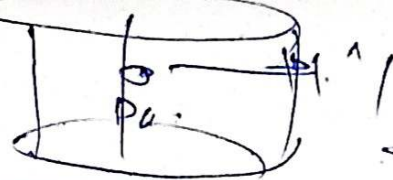
$$= \epsilon_0 \mu_0 \frac{E^2}{B^2} = \epsilon_0 \mu_0 c^2$$

$$c = \frac{1}{\sqrt{\epsilon_0 \mu_0}}$$

$$\frac{1}{c^2} = \epsilon_0 \mu_0$$

$$= \frac{1}{c^2} \times \frac{E^2}{B^2}$$

proved



Wave front due to a point source

At finite distance = spherical

At infinite distance = plane wave front

The concept of secondary wavelets was given by Huygens

Interference of light causes redistribution of light intensity producing alternate bright and dark fringes.

Interference fringes
unequal
fringe

width $\beta = \frac{\lambda D}{a}$

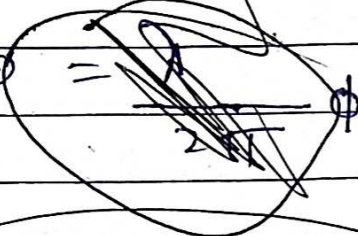
$$A = \sqrt{A_1^2 + A_2^2 + 2A_1A_2 \cos \theta}$$

Amplitude

$\cos 0 = 1$

$\cos \pi = -1$

• ~~Path Difference (Δx)~~



• ~~Brewster's Law~~

~~Polarisation~~

~~$\theta_p = \tan^{-1} \mu$~~

• ~~The color of thin film due to interference~~

• ~~Young's double slit experiment~~

~~Interference~~

~~due to phase difference~~

• ~~Nicol prism is used to produce polarized light~~

Two source of monochromatic light is coherent, when their phase are equal,

In polarised light the angle b/w plane of vibration and plane of polarisation is $\perp$

Chap 13 Object

Isotopes

Same atomic no.

Isobars

Same mass no.

Isotones

Same neutron no. (mass - A_N)

$$N_A = 6.02 \times 10^{23}$$

$$1 \text{ amu} = 931 \text{ MeV}$$

$$P_n = 1.66 \times 10^{-27} \text{ kg}$$

R 2 N

• Nuclear density = $2.3 \times 10^{17} \text{ kg/m}^3$

→ independent from mass no.

• Mass defect

↳ difference of mass of nucleus and sum of the mass of proton and neutron.

• Least stable nucleus

• In nuclear rxn

charge, mvr, linear momentum are conserved.

• ~~alpha rays~~ ~~beta rays~~ ~~gamma rays~~ are deflected in B & E

$T_a = \frac{1}{A}$

$T_{1/2} = 0.693 A = 0.693 T_a$

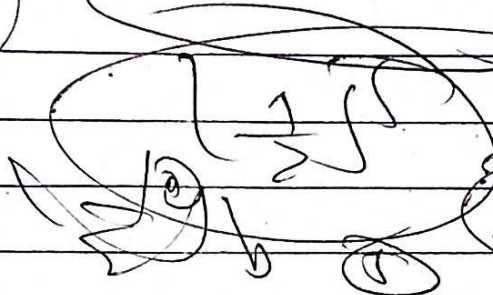
~~gamma rays have max penetrating power. + energy~~

• unit of radioactivity: curie

$$\left(\frac{1}{2}\right)^n$$

no of half-life

~~reaction~~



Total days
half-life

• function of moderator in nuclear reactor

→ Slow the speed of neutrons

• decay const.

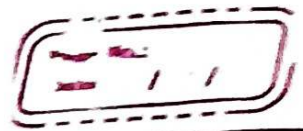
→ unif. theory

Q:

radioactive decay

α decay, β decay, γ decay

Objective Chap-5



• pole strength



magnetic field lines $\vec{N} \rightarrow \vec{S}$



• Torque

$$\vec{\tau} = \vec{m} \times \vec{B}$$

$\vec{B} \times \vec{A}$

• $m \propto L$

of earth

$$8 \times 10^{22} \text{ A.m}$$

• magnetic moment

$$\vec{m} = \vec{IA}$$

• south to North

$$\vec{A} \text{ m}^2$$

$$T = 2\pi \sqrt{\frac{I}{mB}}$$

$$\frac{m_1}{m_2} = \frac{L_1}{L_2}$$

uniform - $T = 2\pi \sqrt{\frac{I}{mB}}$

• tangent Law

$$B = B_H \tan \theta$$

$$W = PB \cos \theta$$

$$W = mB (1 - \cos \theta)$$

Permeability of ferromagnetic

$$\mu > 1$$

$$\mu = B/H$$

Page No.:

Date: / /

On oscillating any metallic sphere in the $\vec{B}$, its oscillatory motion is damping.

Magnetic potential

$$\frac{m}{4\pi r^2}$$

distance from a pole
strength (m)

A neutral point

$$B = BH$$

$$BH \propto n^2$$

freq. of osci of needle

Susceptibility of vacuum = 0

not paramagnetic and

coaster

$$BH = B \cos \theta$$

$$L_m = \frac{\tau}{60} \lg$$

$$\tan \theta = \frac{Br}{BH}$$

angle of def

Dimension of permeability

$$[M L T^{-2} A^{-2}]$$



$$B^2 = B_H^2 + B_V^2$$

• value of B of earth sub

$\rightarrow 10^{-5} \text{ tesla}$

• Intensity of magnetising field (H)

$\rightarrow \frac{B_0}{\mu_0}$

• Declination

Angle b/w magnetic meridian and geographical meridian.

• ferromagnetic materials

$\rightarrow$ show hysteresis

$\rightarrow$ relative permeability $\gg 1$

• R b(n) $\lim_{n \rightarrow \infty} \cos i = \cos r$ then $n = 1$

• Snell's law

$$\frac{\sin i}{\sin r} = \frac{n_1}{n_2} = \frac{\sin c}{\sin 90}$$

$$\frac{\sin c}{\sin i} = \frac{n_1}{n_2}$$

$$\sin c = \frac{1}{n}$$

as $n = 1$

R.T of medium

• primary rainbow

secondary rainbow

• one internal reflection

two internal reflection

• brighter

fainter

• ordered color

• Reversed order of color

• Red color is upper

violet is lower

• violet is lower

Red is upper

• material of optical fibre.

↳ quartz of high quality lead

• Accommodation of eye

↳ Ability of an eye to focus the distant object as well as the near by objects on retina by changing the focal length of eye lens is called accommodation.

• Magnification ✓

↳ $\frac{h_i}{h_o}$

• Magnifying power

↳ angle by i

angle by o

• As we know

$$M = \frac{1 + \frac{D}{f}}{1}$$

So when focus is short, Magnifying power will be max.

e^-

min energy required to
pull electron out of metal
work function

- Minimum energy equal to work function must be given to an electron so as to bring it out of the metal.

$$E = nh\nu$$

$$E = h\nu$$

frequency

energy
of photon

$$6.62 \times 10^{-34} \text{ Js}$$

rest photon = 0

kinetic mass of moving photon = $\frac{h\nu}{c^2}$

- photon is not deflected by B & E .

- $\rightarrow$ collision E total energy & total momentum are conserved.

- Alkali metals show photoelectric effect with visible light.

- The rate of flow of photoelectrons is called photoelectric current.

is directly proportional
intensity of light

- Emitted photon's energy depends on wavelength.

- 2 / 1
- In laser ray, a photon stimulates the emission of another photon of same energy.

• work function of sodium

$$\phi_0 = 2.75 \text{ eV}$$

~~kinetic mass of photon~~ $\frac{h\nu}{c}$

• Same wavelength of e^- & photon

~~then momentum will be same~~

Bio-savart law

→ The magnitude of magnetic field due to element of current carrying wire at any point is directly proportional to

- ① current element
- ② inversely proportional to square of

Fleming left hand rule

→ Whenever a current carrying conductor is placed inside a magnetic field, a force acting acts on conductor in a direction perpendicular to both the direction of the current and magnetic field.

Radial magnetic field is parallel to surface of coil of galvanometer. The deflection coil current is directly proportional to current. In this way, we can use radial field to observe deflection & current.

Cyclotron

A device used to accelerate heavy charge particles (like proton, deuterium) to high speed

Limitation :

- ① It can't accelerate uncharged particle
- ② Suitable only for accelerating heavy particles.

Chap-5 Subjective

• End-on position / Gauss A point
/ tan A point

→ The position of a point which lies on the magnetic axis of magnet

• Broad side position / Gauss B point
/ end-on point

→ position of a point lies on a line through centre of magnet perpendicular to magnetic axis

• Apparent angle of dip

The angle made by magnetic needle with horizontal

• Magnetic potential

Amount of work done required to bring unit north pole from ∞ to any point in magnetic field is called magnetic potential

$$V = \frac{\mu_0 m}{4\pi r}$$

• Magnetic moment

product of poten. into dist

$$M = m(2l)$$

$A m^2$

unit

• Magnetic element of earth.

→ Earth's magnetic field may be specified completely by three quantities called elements of earth's magnetic field.

(1) Angle of declination (θ) - It is the angle b/w geographical and magnetic meridian planes.

(2) Angle of dip (δ)

→ Angle made by resultant magnetic field B with horizontal.

(3) Horizontal component (B_H) of earth's magnetic field (B)

• Comparison of magnetic properties of steel & soft iron.

(1) Magnitude susceptibility of soft iron is greater than steel.

(2) magnetic retentivity of soft iron ~~less~~ less than steel

• Curie temp.

→ Temp at which ferromagnetic substance change into paramagnetic.

• paramagnetic are

→ It has permanent dipole moment.

→ Relative permeability is greater than 1.

Chapter 7: Subjective

→ Reactance

→ Resistance offered by the capacitor or inductor is called reactance. Its SI unit is Ohm.

Ohm

capacitive
↑
reactance

inductive reactance.

→ Impedance: The resistance offered by the A.C. circuit is called impedance.

It is denoted by Z . Its SI unit is Ohm.

• Mean value of A.C. is for half cycle $\frac{2I_0}{\pi}$ but the complete cycle is zero

• Root mean square value

$$I_{r.m.s} = \sqrt{\frac{1}{T} \int_0^T I_0^2 \sin^2 \omega t dt}$$

$$I_{r.m.s} = \frac{I_0}{\sqrt{2}}$$

• Electrical resonance: A phenomenon in which natural frequency is equal to applied frequency is called electrical resonance.

• Wattless current: When the phase difference b/w voltage (emf) and current becomes $\frac{\pi}{2}$ in an AC circuit then the current is said to be wattless. This situation is obtained in case of pure inductive or capacitive circuit.

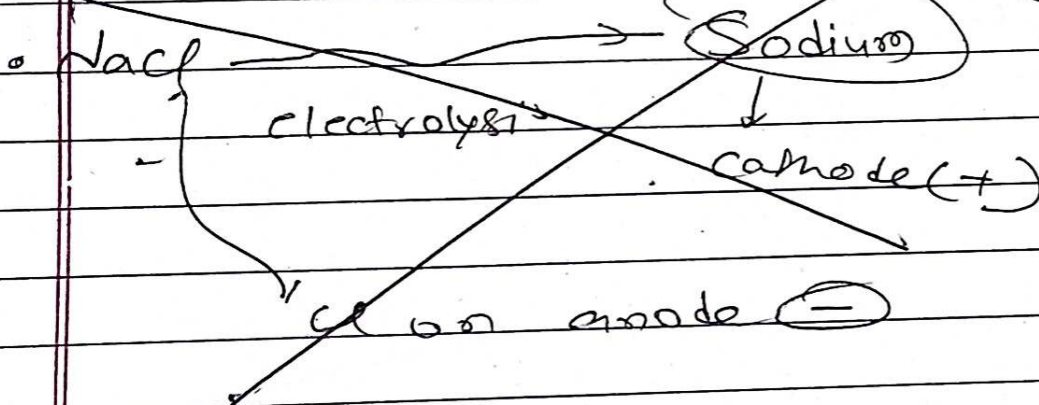
CHEMISTRY

Chap-3

One faraday = 96500 C

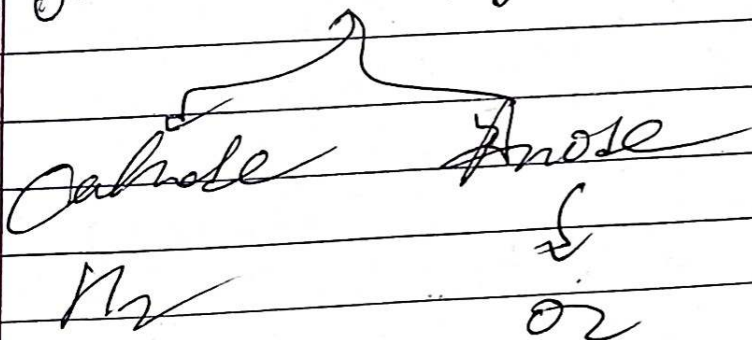
CrO_2 oxides show electrical properties like metal.

When 1 f electricity is transfer it is equal to one gram equivalent



~~The electricity required to liberate~~
~~32g~~

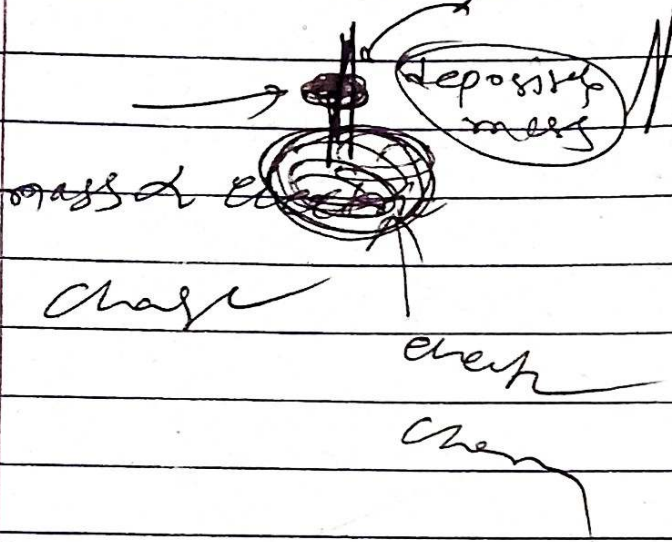
ore electrolysis



Faraday 1st Law



Mass of a substance deposited or liberated at an electrode is directly proportional to quantity of electric charge passed through electrolyte.



have to use
 $m \propto Q$
 $m \propto nF$

Mass of substance which get liberated at an electrode when one coulomb charge passes through the electrolyte



- Cell const of a conductivity cell

$$\frac{l}{A}$$

- Theory of ionisation

→ Arrhenius

- Specific conductance

$$\text{ohm}^{-1}\text{cm}^{-1}$$

$$K = \frac{1}{\rho}$$

- → reciprocal of specific resistance or resistivity is called specific conductance or conductivity.

- Equivalent conductance/molar ^{conductance}
→ conductance of all ions produced by one gram equivalent of mass of an electrolyte in a given soln. (note) ^{conductor}

(B)

• limiting molar conductivity -

↳ When concentration of soln reaches to zero then molar conductivity is called limit of molar concentration

• EMF of cell for cell reaction

①

निबंध

844-14

Page No.
 Date / /

बालकृष्ण मंदर

वार्ता

बेनी प्रसाद 1888 वादवी देवी

इलाहाबाद इलाहाबाद

उपन्यास :- रहस्य कथा, नूतन ब्रह्मचर्य
सौ अनाज एक सुजान, मुफ्त
वेशी, रसातल यात्रा, इतिहास दक्षिण

नाटक :- पद्मावती, बेनी सांसार, शिशुपल
वध, नल दमयंती

प्रहसन :- जैसा काम वैसा परिणाम,
नई रेशमी का विष, आचार
विडंबना

83-22

उद्योग कथा था

मुलैरी

नील का पथर

कदली

विमल राम

1915

काली नागरी प्रचारिणी
पत्रिका

गुलेरी जी धौतड़ी के नावालिग राजा जयसिंह
के अनिवार्य बनकर मैथी कॉलेज अजमेर
आए।

संपूर्ण क्रांति

→ जय प्रकाश नारायण

→ कुलरानी से दूरस्थ

प्रभावती देवी (प्रज्वलित
प्रसाद की पुत्री)

1948 → भारत रत्न

1945 के मैरासेस सम्मान

उमाशंकर टिड्डी

→ ब्रिज ऑफ बंबे - सहाय जी

→ पुरा पुरा

राम नाथ जी गौतम

→ इन्डियन एम्प्रांस

ध्यावाकर्तृ मुद्रा
 शिव धारी सिंह लिखित
 १०४-७५
 अङ्कलपत्र
 गिरालपुर

अर्धनारीश्वर

शैलजी के 'चार मध्याह्न'
 पर साहित्य अकादमी एवं
 उर्वशी पर भारतीय ज्ञानपीठ

सिमरिया बेकु सराय,
बिहार

पत्नी - श्यामवती देवी

माता-पिता - मनरूप देवी
 एवं रवि सिंह

पहली कविता :- १९४३

पहली पुस्तक : प्रकाशना - २१ वर्ष

राज
 २१ वर्ष
 २९ राजा

सचिदानंद हीरानंद वात्स्यायन

अज्ञेय

साहित्य अकादमी, भारतीय
 ज्ञानपीठ

दूसरा सप्तर (१९५१)

मालती के प्रति - गौडेश्वर

१९३० के बाद अज्ञेय जी ने निगमिह
 लेखन शुरू किया।

विन्ध्य

भगता सिंह

11

07-31

एक लेख एक पत्र

विद्यावती देवी एवं
सरदार किशन सिंह

प्रिंस कोपेठकिन एक अर्थशास्त्री

विन्ध्य

कालिदास अवार्ड

और सादानीरा जगदीशचंद्र मथुर

लौलटे प्रजा पुस्तक से।

कदुजग सम्प्रेषण के माध्यम
पुस्तक

आश्रम विद्यालय (गौंधी जी)
बड़हरवा, मधुवन और चित्तहरवा में

आपस में छांगड़ मिश्रित औरों, मधुवन
में लौलटे से।

चमारण अंकोलन में गौंधी जी के सलाहक

हरणस सहाय

गौरखपुर जिले में गंडक नदी की
नारायणी नदी बहा जाता है।

गाँधीजी ने पुंडलीक को निर्दिष्ट
आश्रम बैलगाँव बुलाया।

सिपाही की माँ

→ मोहन राकेश → नई कहानी ऑफ़ीलन

एकंजी

→ "उंडे के छिलके इत्या अन्य एकंजी"

→ बचपन का नाम - महान मोहन -

गुरु गुरुगाली

→ गान्धे संग्रह - आषाढ़ का एक दिन

गान्धे के क्षेत्र में जयशंकर प्रसाद के बाद
की सबसे बड़ी प्रतिभा मोहन राकेश।

जन्म - अमृतसर, पंजाब

खाननगर और जलनगर, वारिस

→ मोहन राकेश

दुग्गी - 14 वर्ष

1962 ई० में मोहन राकेश साहित्य पर के
सौपाक थे।



900

1971
उत्तराखण्ड
100

निबंध

प्रगीत और समाज

नामवर सिंह

विवाद विवाद संवाद

अलोचना त्रैमासिक के प्रधान सम्पादक ✓

नामवर सिंह

जनश्रुति

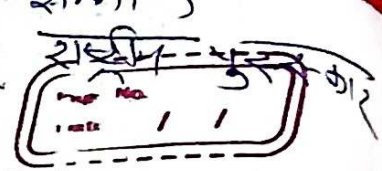
रामचंद्र शुक्ल के काव्य-सिद्धांत के
आदर्श

प्रबंध काव्य

20 वीं शदी में प्रगतित्मकता का दूसरा उन्मेष
रामचंद्र उन्मेष के साथ हुआ

श्रीलंकाम

1995 + 1996 परवश
STG अंकित
(1993)



गुब्बू और प्रमोद का लीपि

संविधान का
संताप

दलित संविधान का सौन्दर्यशास्त्र

मुजफ्फरनगर

आलौचना पुरस्कृत

स्कूल के हेमरासुर - कलीराम

बड़ा भाई - सुखवीर

अब और नहीं कविता

एक पशु की खाल - 20-25 रु०

हँसते हुए मेरा अकेलापन

जमरी

मलयाज

न आनेवाला
कल, संविधान का
संताप

बकलाग खुद

जबकि पर धूल

संताप और एकात्मता

20

Vann → Water

vin → Wine

Bødd 
bread

melk ÷ milk

og ÷ and

Kaffe ÷ coffee

eller ÷ or

te ÷ tea

Takk → Thanks

Nae

Ja ÷ yes

de

det ÷ that

~~Welco~~ \$0 4

\$1 ÷ beer

med

hei ÷ hi

Velkommen

hallo ÷ hello

hei

Welcome

Velkommen